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(71) Applicant(s)

Beaumont House Limited

(Incorporated in the United Kingdom)

**1-4 Lyall Court, Maulden Road, Flitwick,
Bedfordshire, MK45 1UQ, United Kingdom**

(72) Inventor(s)

Simon Levesley

(74) Agent and/or Address for Service

Russell-Rayner

**Business Centre West, Avenue One, Business Park,
LETCWORTH GARDEN CITY, Hertfordshire,
SG6 2HB, United Kingdom**

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(54) Liquid dispenser

(57) A device for dispensing a measured quantity of a liquid from an opened bottle when mounted in an inverted position, the device comprising a elongate chamber (2); a longitudinally directed axially located dividing wall (5) separating the elongate chamber into first and second side-by-side separate chambers (3, 4) of a similar volume one relative to the other; end closures (8, 9) for closing the ends of the cylindrical elongate chamber; two openings (7, 8; 11, 12) in the end closures positioned such that an opening of each end closure communicates with the separate chambers; means (14) for mounting the elongate chamber so that the separate chambers can be alternately moved to a position in which, when the inlet of either of the chambers is positioned to receive liquid from the bottle or other container, the outlet of the other chamber is located at a position at which any liquid therein can be discharged into a glass or other receptacle.

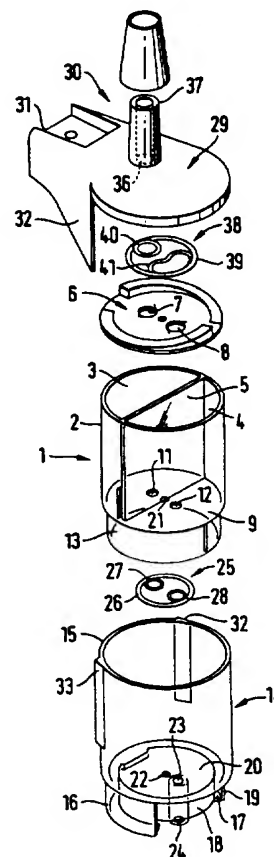


Fig. 1

1/3

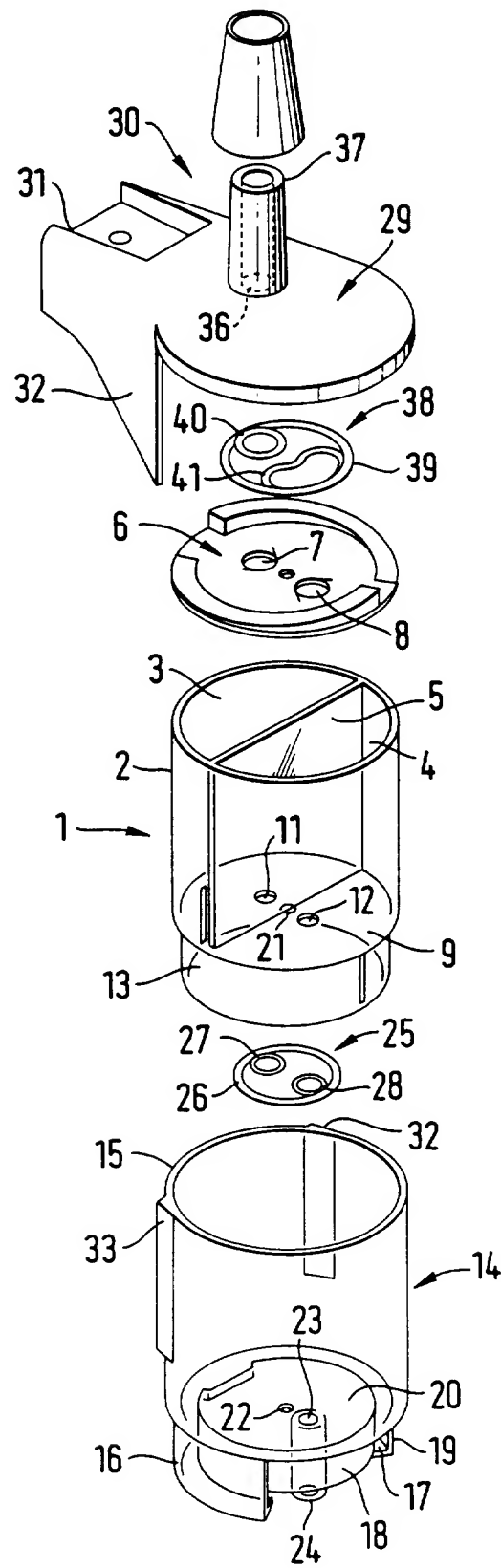


Fig. 1

2/3

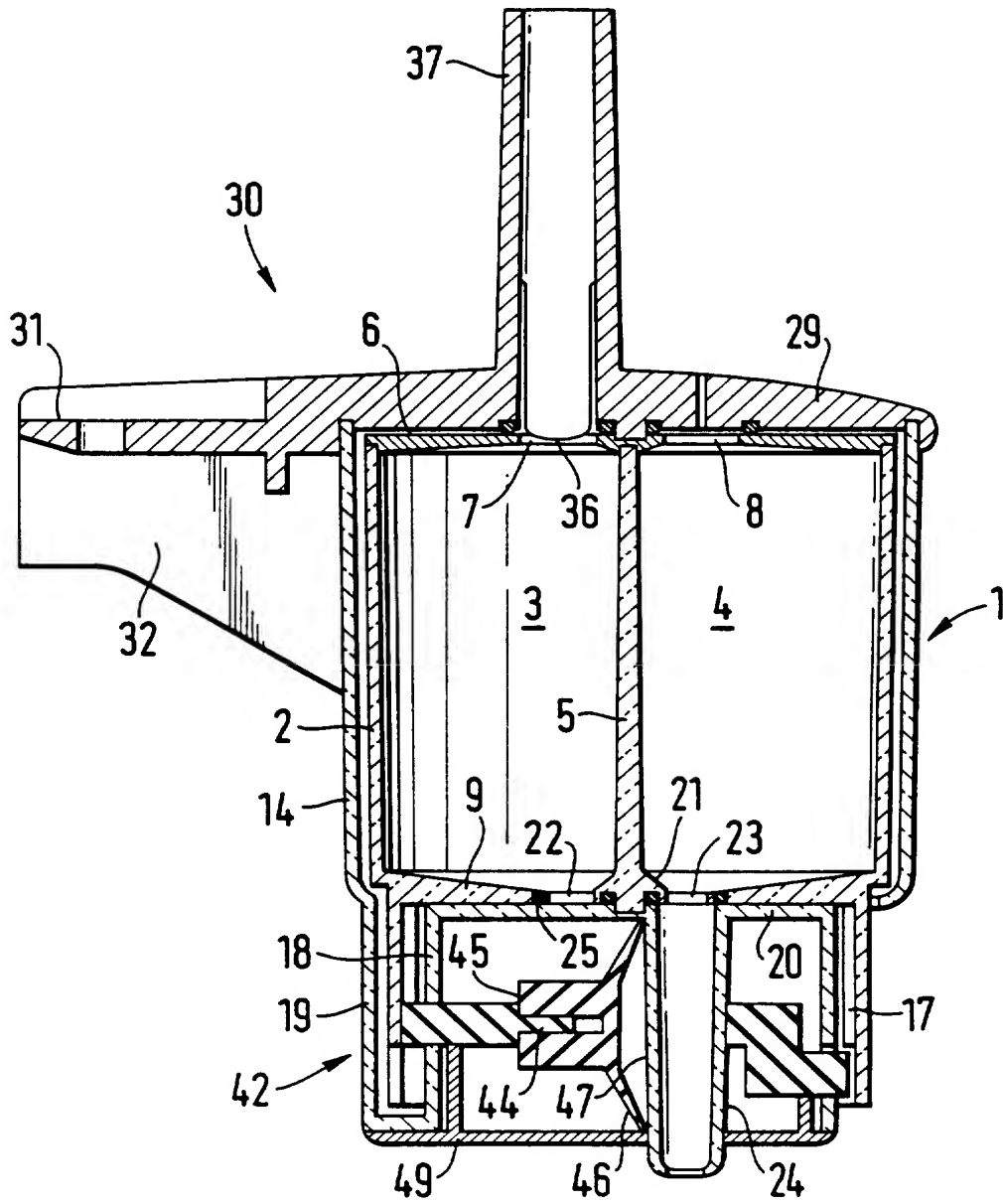


Fig. 2

3/3

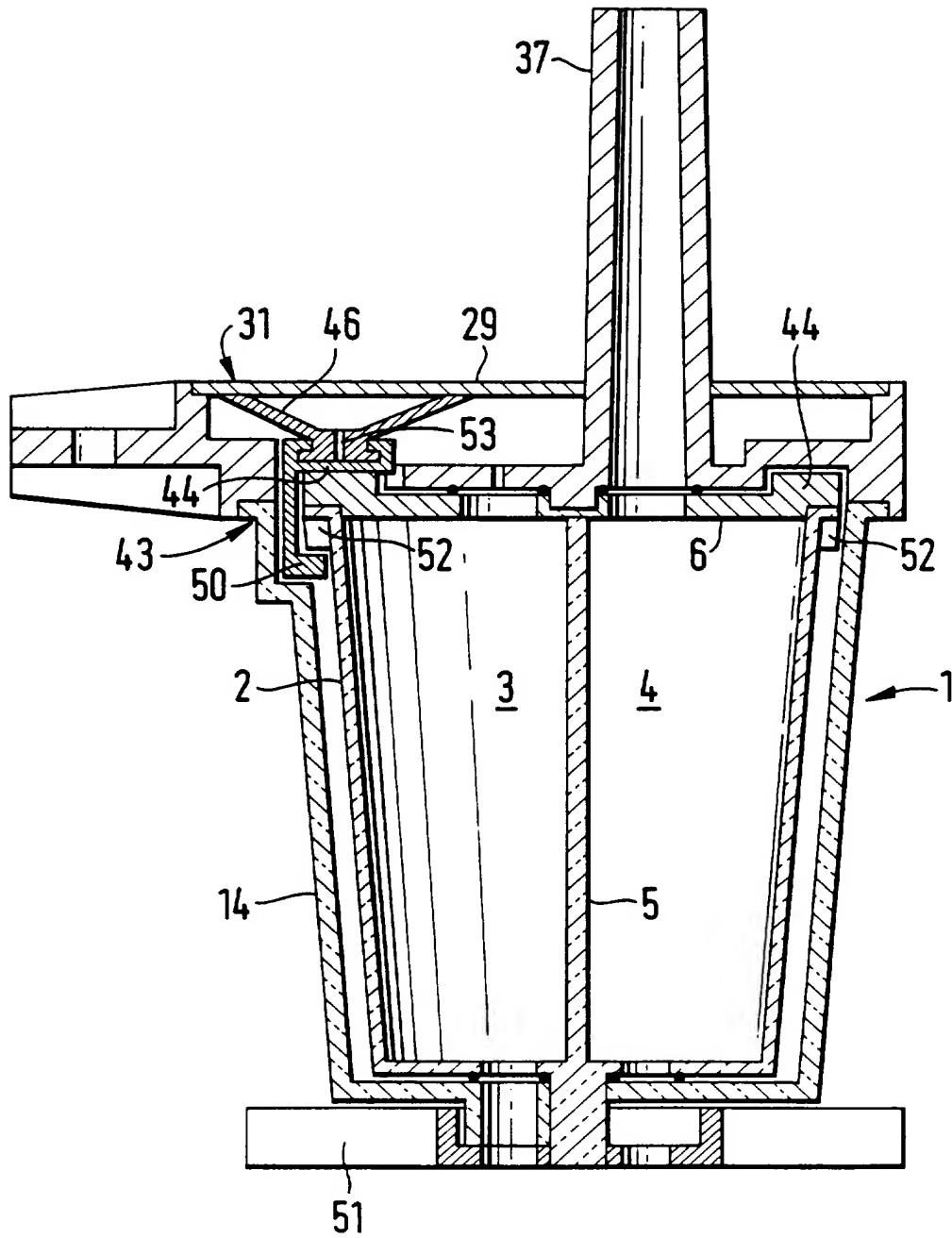


Fig. 3

LIQUID DISPENSER

This invention relates to the dispensing of liquids from containers.

5 It is frequently necessary to be able to remove known quantities of a liquid from a container such as a bottle.

In particular, in relation to the marketing of beverages such as alcoholic drinks commonly identified as spirits such a whiskey, gin, vodka etc., it is a general practice to market such spirits by the unopened bottle or otherwise
10 only by dispensing and selling very carefully measured amounts from an opened bottle.

Many forms of devices for dispensing carefully measured amounts of spirits or, of course, whatever type of liquid is required to be dispensed from an opened bottle are
15 known.

Generally speaking, for the purposes of dispensing such liquids the device to be used is mounted to the open mouth of the bottle the device being such that when the bottle is subsequently mounted in an inverted position a control
20 valve combination incorporated in the device normally prevents the liquid i.e., spirit from discharging from the bottle, and when it is required to discharge a predetermined quantity of the liquid from the bottle the valve combination is operated to enable discharge of the
25 liquid. The valve combination is adapted such that air is able to enter into the bottle to allow gavity feed of liquid from the bottle to the device for the purposes of enabling the liquid to leave the bottle.

Traditionally, for a variety of reasons it is necessary for the device to be of such construction as to incorporate a liquid receiving chamber having a very precise volume namely one which establishes the volume of liquid being
5 dispensed. The construction of the device is also such that the chamber has to be fillable/filled with the liquid to be dispensed whilst the valve combination is preventing discharge of the liquid into an external receptacle such as a glass. This setting can be regarded as, for example, the
10 liquid discharge closed setting.

In practice, it is essential for official regulation purposes that a would be purchaser of the liquid from the bottle should be able readily to ascertain that the chamber is filled. For this reason the wall of the chamber is
15 invariably transparent.

It is additionally convenient to note that with such devices the valve combinations have, for official regulation reasons to be of such construction as to incorporate a first valve part controlling actual discharge of liquid
20 from the bottle into the volume measuring chamber and a second valve part for controlling the liquid discharge from the chamber into the glass or other receptacle.

Arrangements are also incorporated for ensuring that both valve parts cannot be simultaneously opened sufficiently to
25 allow simultaneous flow of liquid from the bottle to the chamber and flow of liquid from the chamber to the external receptacle.

In practice, the construction and operation of these two valve parts has been found to involve inherent difficulties
30 in ensuring that the double opening situation cannot occur whilst at the same time ensuring that the viewing and measuring chamber is correctly filled.

It is an object of the present invention to provide a construction of a device for dispensing a measured quantity of liquid from a bottle or like container which facilitates the satisfactory dispensing of liquids from the bottle or
5 like container.

Broadly, according to a first aspect of the present invention there is provided a device for dispensing a measured quantity of liquid from an opened bottle or like container when mounted in an inverted/inclined position,
10 the device comprising; first and second separate chambers each adapted for receiving a similar volume of liquid, each separate chamber having a liquid inlet for receiving the liquid to be dispensed from the bottle or other container and a liquid outlet through which liquid is dischargeable
15 from the associated chamber; means for so positionally mounting the separate chambers with respect to each other that they can be alternately moved to a position such that when the inlet of one of the chambers is positioned to receive therein liquid from the bottle or other container,
20 the outlet of the other chamber is located at a position at which any liquid previously introduced therein can be discharged into a glass or other receptacle.

Preferably, the device is used when the bottle or other container is mounted in an inverted position, the device
25 being adapted for mounting to the bottle or other container mounting means.

In a preferred construction the two separate chambers are located in side-by-side relationship and mounted for rotation around a common axis for the purposes of the
30 filling and discharge thereof.

Preferably, means are provided for limiting the freedom of

rotation of the chambers about said axis, the arrangement being such as to ensure that adequate time is allowed between each rotation as to ensure that the container next to receive liquid remains at its filling position long enough to ensure the satisfactory filling thereof before being further rotatable to its liquid discharge position.

In a preferred arrangement timing means are provided for timewise controlling release of means for preventing rotation of the chambers.

Conveniently, the operation of the timing means involves compressing a compressible element during the rotation of the chambers and using the time required for the compressed element to restore to its uncompressed condition as the timing interval.

In a further construction means are provided for causing a suction element suctionwise to engage with the rotatable chambers during the rotation thereof, the arrangement being such that on completion of a said rotation the suction effect is allowed slowly to release over a characteristic time period thereby to allow further rotation of the chambers after such time period.

Broadly, according to a second aspect of the invention there is provided a device for dispensing a measured quantity of a liquid from an opened bottle or other container when mounted in an inverted/inclined position, the device comprising a elongate chamber; a longitudinally directed axially located dividing wall separating the elongate chamber into first and second side-by-side separate chambers of a similar volume one relative to the other; end closures for closing the ends of the cylindrical elongate chamber; two openings in each end closure positioned such that an opening of each end closure

communicates with the separate chambers; means for mounting the elongate chamber so that the separate chambers can be alternately moved to a position in which, when the inlet of either of the chambers is positioned to receive liquid from the bottle or other container, the outlet of the other chamber is located at a position at which any liquid therein can be discharged into a glass or other receptacle.

For a better understanding of the invention and to show how to carry the same into effect reference will now be made to the accompanying drawings in which:-

Figure 1 very schematically illustrates in exploded representation the general construction of a first embodiment of a device for controlling the discharge of a liquid from an inverted/inclined bottle or other container, the Figure also showing alternative locations for the operation timing arrangements of the device;

Figure 2 illustrates as a sectional representation the device of Figure 1 and specifically illustrates the positioning of the timing arrangement at the bottom of the device; and

Figure 3 illustrates as a sectional representation the device of Figure 1 and specifically illustrates the positioning of the timing arrangement at the top of the device;

Referring now to Figure 1 of the drawings, the device shown therein comprises an elongate cylindrical shaped chamber 1 including a transparent cylindrical wall 2. The interior of the chamber 1 is divided into two similar separate D-shaped chambers 3 and 4 by an axially extending wall 5. The chambers 3 and 4 are of similar volumes. In practice, for the reasons above mentioned, these two volumes are

required to be, as close as possible, identical one to the other.

The upper end of the cylindrical wall is closed by an end closure 6. Two openings 7 and 8 are provided in the end closure 6. These openings 7 and 8 are so positioned that the opening 7 communicates with the chamber 3 and the opening 8 communicates with the chamber 4.

The lower end of the cylindrical wall is closed by an end closure 9. Two openings 11 and 12 are provided in the end closure 9. These openings 11 and 12 are so positioned that the opening 11 communicates with the chamber 3 and the opening 12 communicates with the chamber 4. The closure 9 includes a downwardly depending skirt 13.

The chamber 1 is rotatably mounted in a transparent outer housing 14. The housing 14 has a main cylindrical wall 15. The lower part 16 of the outer housing 14 is effectively double walled to provide an annular recess 17 for receiving the skirt. The lower part 16 has inner and outer wall parts 18 and 19 and a top plate 20 upon which the elongate container 1 is rotatably mounted by way of a spigot 21 provided on the underside of the lower closure 9 engaging with a bore 22 centrally located in the top plate 20.

An liquid outlet opening 23 is provided in the top plate 20 this opening being so positioned in the top plate 20 that the openings 11 and 12 in the bottom end closure 9 of the elongate chamber 1 can align therewith.

A tube 24 depends downwardly from the periphery of the opening 23 to project outwardly beneath the outer housing 14, to provide a liquid outlet from the inner elongate chamber which thus alternately communicates with the interiors of the separate chamber 3 and 4.

A bottom seal 25 is provided to prevent any leakage of fluid between the elongate container 1 and the cover plate 20 and thus the outer housing 14. This seal 25 is conveniently mounted to the inner elongate container 1 and rotates therewith. As may be seen from the Figure 1 the seal 25 is provided with a general circular sealing ring 26 and two smaller sealing rings 27 and 28 which specifically serve to prevent leakage between the openings 7 and 8 and the opening 23.

The upper end of the outer housing 14 is permanently secured to a mounting plate 29 of a so-called head plate unit 30 which is adapted as, for example, at 31 for connection to a support (not shown) whereby the assembly of the outer housing 14 and elongate chamber 1 can hang vertically from the unit 30. The head plate unit 30 incorporates side wings 32 which are intended to be engaged by elongate locator strips 33 extending lengthwise of the outer housing.

The mutual cooperation of these locator strips 33 and the side wings 32 ensures that the outer housing 14 can only be secured to the head plate unit 30 with a particular orientation.

A short closed end recess 34 is formed in the end closure 6 of the elongate chamber, this recess 34 is intended to be engaged by a spigot 35 depending from the underside of the plate 29 (the spigot 35 is not shown in Figure 1). This upper spigot and recess combination provides the upper rotatable mounting for the elongate chamber 1 within the outer housing.

A though bore 36 is provided in the head plate unit 30. The upper end of the bore connects with an upstanding tube 37,

the so-called separator which is to be inserted into the mouth of a bottle (not shown). A suitable seal 38 such as an annular tapered resilient tube of compressible material/cork is provided to provide a fluid tight seal between the bottle neck and the upstanding tube 37.

The lower end of the bore 36 is so positioned in the head plate 29 that the openings 7 and 8 can be alternately aligned therewith.

A top seal 38 is provided to prevent fluid leakage between the head plate unit 30 and the upper surface of the end closure 6. The seal 38 includes a circular main sealing ring 39 and two smaller sealing parts 40 and 41 which specifically serve to prevent leakage between the openings 7 and 8 and the periphery of the lower end of the bore 36.

It will be noted that the part 41 is elongate, the purpose of this being to accomodate the relative rotational movements of the chamber 1 and the outer housing.

Arrangements not shown in Figure 1 are provided for rotating the inner elongate chamber.

Since in use it is important to ensure that the inner elongate container is enabled to remain in a part chamber filling position long enough to ensure that the requisite amount of liquid has entered the part chamber being filed means are provided for restraining the rotation of the inner elongate housing 1 for a predetermined time period after a previous rotation. Conveniently this can be regarded as a timer unit.

In practice, the timer unit can be mounted either at the upper end of the elongate chamber or at the lower end thereof.

The Figure 1 generally illustrates at 42 the case where the timer unit is located at the lower end of the elongate container. However, for convenience of illustration, a possible construction of a timer unit 43 when positioned at the upper end of the elongate chamber 1 has been very schematically indicated Figure 1.

In practice, only one such timer unit would be incorporated.

The lower mounted timer unit 42 will now be discussed with reference to Figure 2. Those components of Figure 2 which have the same function as those discussed in relation to Figure 1 will be identified by the same reference numerals.

For convenience, it will be presumed that the sole difference between Figures 1 and 2 reside in the details of the construction of the timer unit 42.

The timer unit 42 includes a cam follower system incorporating two separate portions 44 such that for a complete rotation of the rotatable part of the device the camming effect is repeated twice, once for each separate portion and thus separate chamber 3/4. The Figure 2 shows only one of the camming portions 44 which has a part ring-like form, which is positionally mounted within the chamber formed within the skirt 18 and which is constrained to rotate therewith. The actual camming surface 45 of the portion 44 is radially inwardly directed and progressively spirals inwards towards the axis of rotation of the two separate chambers 3/4. The angular spread of the camming surface 45 is related to the angular rotation required to complete a filling/discharge rotation of a separate chamber 3,4.

The camming portion 44 cooperates with a suction element 46 which is positionally constrained against rotation with the separate chambers 3/4. The suction element 46 operationally cooperates with a surface 47, for example, provided on the side wall of the liquid outlet 23/24. In operation, the rotation of the rotatable separate chambers 3/4 rotates the camming portion 44 and in so doing causes the camming surface 45 operationally effectively move radially inwardly displace the suction element 46 towards the surface 47. This movement progressively presses the suction element 46 against its cooperating surface 47 thereby progressively increasing the resistance to rotation effect between the suction element 46 and the associated surface 47. The operational profile of the camming surface 46 is such that at the end of a liquid discharge rotation of the separate chambers 3/4 the suction element 46 is fully locked in place. However, at this particular position the camming effect produced by the camming surface 45 stops so that pressure exerted thereby upon the suction element 46 terminates whereby the suction element 46 is free slowly to return to its non-compressed condition thereby progressively releasing its grip on said fixed part 47. Once the suction release has been completed the chambers 3/4 are once again free to rotate.

After this condition has been attained the next rotation of the chambers brings the other camming surface into action.

The arrangements provided for facilitating rotation of the two separate chambers can comprise a lever (not shown) that is mounted to a closure element 49 secured to the bottom of the outer housing.

Referring now to Figure 3, this Figure as mentioned illustrates an embodiment of a liquid dispenser incorporating the timer unit 43 located at the upper end

thereof.

Whilst some of the specific details of the device shown in Figure 3 are different from those disclosed in Figures 1 and 2 previously discussed hereinbefore the differences essentially arise from the change in the positioning of the timer unit and simplification of various components as a result further description of the unit as a whole is not thought necessary.

Turning now to the timer unit 43, in the construction of this unit, the two camming portions 44 are located upon the upper part of the top cover 6 whereby the actual camming surface spiral profile varying longitudinally of the axis of rotation of the separate chambers 3/4.

The suction element 46 is upwardly facing and cooperates with the under surface of the cover plate 29 of the unit 30. The suction element 46 is carried by a cam follower element 50. The camming surfaces 46 are upwardly facing.

In use, during rotation of the chambers 3/4 this rotation being effected by an operating lever arrangement 51 located at the base of the device and operationally coupled with the rotatable chambers 3/4 the interaction between the operative camming surface 45 and the cam follower element 50 causes the latter to displace the suction element 46 towards the cover plate 29. At the same time the follower element 50 is being lifted to the setting at which it is able to abut a stop 52. By the time this position has been reached the suction element 46 has been firmly pressed against the cover plate 29.

A stop 52 is provided at each end of a camming surface 46 so that rotation is automatically stopped at the end of a required extent of rotation. It will be understood that at

this point the camming surface 45 at that time cooperating with the suction element 46 will have, by way of the cam follower element 50, been firmly pressed into locking engagement with the cover plate 29.

- 5 An air bleed hole 53 is provided in the cam follower element 50 in such position that when the cam follower element has reached the associated stop 52 air is able to enter the suction element 46 to release progressively the suction locking effect being produced by the suction
10 element 46. This allows the suction element 46 physically to return to its non-compressed setting thereby allowing cam follower element 50 to fall under gravity so as to free itself from engagement with the stop 52 to allow the next rotation of the chambers 3/4.

CLAIMS.

1. A device for dispensing a measured quantity of liquid from an opened bottle or like container when mounted in an inverted/inclined position, the device comprising; first
5 and second separate chambers each adapted for receiving a similar volume of liquid, each separate chamber having a liquid inlet for receiving the liquid to be dispensed from the bottle or other container and a liquid outlet through which liquid is dischargeable from the associated chamber;
10 means for so positionally mounting the separate chambers with respect to each other that they can be alternately moved to a position such that when the inlet of one of the chambers is positioned to receive therein liquid from the bottle or other container, the outlet of the other chamber
15 is located at a position at which any liquid previously introduced therein can be discharged into a glass or other receptacle.

2. A device as claimed in claim, and wherein the two separate chambers are located in side-by-side relationship
20 and mounted for rotation around a common axis for the purposes of the filling and discharge thereof.

3. A device for dispensing a measured quantity of liquid from an opened bottle or like container when mounted in an inverted/inclined position, the device comprising a
25 elongate chamber; a longitudinally directed axially located dividing wall separating the elongate chamber into first and second side-by-side separate chambers of a similar volume one relative to the other; end closures for closing the ends of the cylindrical elongate chamber; two openings
30 in each end closure positioned such that an opening of each end closure communicates with the separate chambers; means

for mounting the elongate chamber so that the separate chambers can be alternately moved to a position in which, when the inlet of either of the chambers is positioned to receive liquid from the bottle or other container, the
5 outlet of the other chamber is located at a position at which any liquid therein can be discharged into a glass or other receptacle.

4. A device as claimed in claim 1, 2 or 3,, and wherein means are provided for limiting the freedom of rotation of
10 the chambers about said axis, the arrangement being such as to ensure that adequate time is allowed between each rotation as to ensure that the container next to receive liquid remains at its filling position long enough to ensure the satisfactory filling thereof before being
15 further rotatable to its liquid discharge position.

5. A device as claimed in claim 4, and wherein timing means are provided for timewise controlling release of means for preventing rotation of the chambers.

6. A device as claimed in claim 5, wherein the timing
20 means is located below the chambers.

7. A device as claimed in claim 5, wherein the timing device is located above the chambers.

8. A device as claimed in claim 5, 6 or 7, and wherein the timing device includes a cam follower system
25 incorporating two separate camming surfaces whereby for a complete rotation of the chambers the timing means is operated twice once for each chamber; and wherein each camming surface is arranged to control the operational setting of the time setting arrangement of the timer means.

9. A device as claimed in claim 8, and wherein the camming surface is radially inwardly directed and progressively spirals inwards to the axis of rotation of the chambers, and wherein the angular spread of the camming surface is related to the angular rotation required to complete a liquid filling/discharge rotation of a separate chamber.

10. A device as claimed in claim 8, and wherein the camming surface is arranged progressively to spiral inwards longitudinally of the axis of rotation of the chambers, and wherein the axial lift of the camming surface is related to the angular rotation required to complete a liquid filling/discharge rotation of a separate chamber.

11. A device as claimed in claim 8, 9 or 10. and wherein the timing means includes a compressible element, and wherein the operation of the timing means involves compressing the compressible element by a camming surface during the rotation of the chambers and using the time required for the compressed element to restore to its uncompressed condition as the timing interval.

12. A device as claimed in claim 8, 9, 10 or 11, and wherein the timing means includes a suction element arranged suctionwise to engage with a non rotatable region of the device during the rotation of the chambers, the arrangement being such that on completion of a said rotation the suction effect is allowed slowly to release over a characteristic time period thereby to allow further rotation of the chambers after the suction element has released its suction effect following such time period.

13. A device as claimed in any one of the preceding claims, and wherein the device is adapted for mounting to a bottle or other container mounting means.

5. 14. A device for dispensing a measured quantity of a liquid from an opened bottle or other container when mounted in an inverted/inclined position, constructed and arranged to operate substantially as hereinbefore described with reference to Figure 1, Figures 1 and 2, and Figures 1 and 3 of the accompanying drawings.

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Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

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- (ii) Int Cl (Ed.6) B67D 3/00 G01F 11/10, 11/12,
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Search Examiner
MR S WALLER

Date of completion of Search
12 DECEMBER 1995

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

Documents considered relevant following a search in respect of Claims :-
1-14

(ii) ONLINE: WPI

Categories of documents

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| <p>X: Document indicating lack of novelty or of inventive step.</p> <p>Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.</p> <p>A: Document indicating technological background and/or state of the art.</p> | <p>P: Document published on or after the declared priority date but before the filing date of the present application.</p> <p>E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.</p> <p>&: Member of the same patent family; corresponding document.</p> |
|--|---|

Category	Identity of document and relevant passages	Relevant to claim(s)
X,P	GB 2279063 A (GLADSTON) See Figure 1, page 6, lines 2 to 24	1, 2, 13
X	GB 0629074 (ROGERS) See Figure 1, page 3, line 12 to page 4, line 11	1, 2, 3
X	GB 0299504 (COUGHTRIE)	1, 2, 13

Databases:The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).